

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A method comprising:
generating a calibration filter based on a calibration pulse-compression signal received at a receiver from a transmitter, an estimate of noise, and a previously defined ideal signal; and
generating a calibrated signal by applying the generated calibration filter to reflected pulse-compression signals that are received at the receiver from an antenna.
2. The method of Claim 1, wherein the calibration pulse-compression signal bypasses the antenna.
3. The method of Claim 1, wherein generating a calibration filter is further based on previously generated associated calibration filters.
4. The method of Claim 1, wherein generating the calibration filter comprises:
generating a digital signal based on the calibration pulse-compression signal;
generating a frequency domain signal based on the generated digital signal;
and
generating a set of weighting factors based on the frequency domain signal, the ideal signal, and the estimate of noise.
5. The method of Claim 4, wherein generating a calibration filter comprises normalizing the weighting factors with respect to noise gain.

6. The method of Claim 1, wherein the calibration pulse-compression signal is processed by radar front end processing components.

7. The method of Claim 1, further comprising displaying an image based on the calibrated signal.

8. An apparatus comprising:

- a means for generating a calibration filter based on a calibration pulse-compression signal received at a receiver from a transmitter, an estimate of noise, and a previously defined ideal signal; and
- a means for generating a calibrated signal by applying the generated calibration filter to reflected pulse-compression signals that are received at the receiver from an antenna.

9. The apparatus of Claim 8, wherein the calibration pulse-compression signal bypasses the antenna.

10. The apparatus of Claim 8, wherein the means for generating the calibration filter generates the calibration filter further based on previously generated calibration filters.

11. The apparatus of Claim 8, wherein the means for generating the calibration filter comprises:

- a means for generating a digital signal based on the calibration pulse-compression signal;
- a means for generating a frequency domain signal based on the generated digital signal; and

a means for generating a set of weighting factors based on the frequency domain signal, the ideal signal, and the estimate of noise.

12. The apparatus of Claim 11, wherein the means for generating the calibration filter comprises a means for normalizing the weighting factors with respect to noise gain.

13. The apparatus of Claim 8, wherein the calibration pulse-compression signal is processed by radar front end processing components.

14. The apparatus of Claim 8, further comprising a display for displaying an image based on the calibrated signal.

15. A computer program product residing on a computer-readable medium, the computer program product comprising:

a component for generating a calibration filter based on a calibration pulse-compression signal received at a receiver from a transmitter, an estimate of noise, and a previously defined ideal signal; and

a component for generating a calibrated signal by applying the generated calibration filter to reflected pulse-compression signals that are received at the receiver from an antenna.

16. The product of Claim 15, wherein the calibration pulse-compression signal bypasses the antenna.

17. The product of Claim 15, wherein the component for generating the calibration filter generates the calibration filter further based on previously generated associated calibration filters.

18. The product of Claim 15, wherein the component for generating the calibration filter comprises:

- a component for generating a digital signal based on the calibration pulse-compression signal;
- a component for generating a frequency domain signal based on the generated digital signal; and
- a component for generating one or more weighting factors of the frequency domain signal based on the ideal signal and the estimate of noise.

19. The product of Claim 18, wherein the component for generating the one or more weighting factors further comprises a component for normalizing the one or more weighting factors with respect to noise gain.

20. The product of Claim 15, wherein the calibration pulse-compression signal is processed by radar front end processing components prior to being used by the component for generating the one or more weighting factors.

21. The product of Claim 15, further comprising a component for preparing an image for display based on the calibrated signal.

22. A self calibrating radar system that includes a radar signal generator, the system comprising:

- an antenna;
- a receiver in signal communication with the antenna;
- a transmitter in signal communication with the antenna, the radar signal generator, and the receiver, the transmitter generates a pulse-compression waveform and a calibration pulse-compression waveform based on pulse-compression signals sent by the radar signal generator,

wherein the pulse-compression waveform is transmitted to the antenna and the calibration pulse-compression waveform is transmitted to the receiver, wherein the antenna receives a reflection of the transmitted pulse-compression waveform and sends the reflection of the transmitted pulse-compression waveform to the receiver; and

a radar processor in signal communication with the receiver, the radar processor comprising:

- a component configured to generate a calibration filter based on the calibration pulse-compression signal received by the receiver, an estimate of noise, and a previously defined ideal signal; and
- a component configured to generate a calibrated radar signal by applying the generated calibration filter to the reflected pulse-compression signal received by the antenna.

23. The system of Claim 22, wherein the component configured to generate the calibration filter generates the calibration filter further based on previously generated associated calibration filters.

24. The system of Claim 22, wherein the component configured to generate the calibration filter comprises:

- a digital to analog converter configured to generate a digital signal based on the calibration pulse-compression signal;
- a fast Fourier Transform component configured to generate a frequency domain signal based on the generated digital signal; and

a component configured to generate one or more weighting factors based on the frequency domain signal, the ideal signal, and the estimate of noise.

25. The system of Claim 24, wherein the component configured to generate the calibration filter comprises a component configured to normalize the one or more weighting factors with respect to noise gain.

26. The system of Claim 22, wherein the calibration pulse-compression signal is processed by radar front end processing components.

27. The system of Claim 22, further comprising a display for displaying an image based on the calibrated signal.